among which are Mr. D. A. Rothrock's papers on point invariants for the Lie groups of the plane, and on differential invariants derived from point invariants. To those interested in the geometry of the triangle, Mr. Robert Judson Aley's list of concurrent sets of three lines connected with the triangle will prove a most useful synopsis for purposes of reference; it enumerates eighty-four different concurrences. The same writer communicates a note on a new triangle and some of its properties; while Mr. C. E. Smith, of Indiana University, discusses the geometry of Simson's line. A linear relation between certain of Klein's X-functions and sigma functions of lower division value is given in a note by Mr. John A. Miller.

A FEW years ago Lussana discovered that the electric resistance of aqueous solutions presented certain anomalies in the neighbourhood of the temperature of maximum density, these anomalies being represented by a point of inflection in the curve expressing the relation between the resistance and the temperature. In view of the objections raised against Lussana's work and the intimate relation known to exist between the electric resistance of a fluid and its viscosity, it occurred to Dr. G. Pacher to examine whether any variations analogous to those found by Lussana existed in the coefficient of viscosity of water near the temperature of 4° C. The results of Dr. Pacher's experiments are described in a paper in the *Atti del R. Istituto Veneto*, lviii. (2), pp. 785–814. The coefficient of viscosity was found by observing the efflux of the liquid through a capillary tube, Poiseuille's law being assumed, and the temperature was maintained constant by immersing the tube in a water bath. From the viscosity its temperature-coefficient was calculated and represented graphically by a curve. The conclusions arrived at are as follows: (1) In the neighbourhood of 4° the viscosity of distilled water presents an anomaly indicated by a point of inflection in the curve connecting he viscosity with the temperature; (2) the temperature-coefficient of the viscosity presents a maximum followed by a minimum between the temperatures of 3° and 6°; (3) given the relation between the temperature-coefficient of viscosity and that of electrical resistance, a similar anomaly may be expected to exist in the electrical resistance of distilled water; (4) Lussana's results thus receive indirect confirmation from the present investigation.

A POPULAR account of the possibilities and difficulties of aërial navigation, based upon the scientific experiments made by Langley, Lilienthal, Pilcher, Maxim and others, appears in the current number of the *Fortnightly Review*.

SIR JOHN EVANS'S presidential address, on "The Antiquity of Man, with especial reference to the Stone Age in Egypt," delivered at the Birmingham and Midland Institute, has recently been published. It is a brightly written sketch of a vast subject; the more important approximate dates are given, which is a useful feature.

THOSE who are interested in Indian folk-lore must always keep an eye upon the *Journal* of the Asiatic Society of Bengal. The first part of the new volume of the Anthropological Section for this year contains a variety of interesting papers, amongst which may be noted one, by Mr. C. C. Mitra, on folk-lore about birds, and one, by Mr. C. A. Silberrad, on a rain-compelling ceremony which is performed by women.

A COPY of the Report and Transactions of the South-Eastern Union of Scientific Societies, containing an account of the proceedings at the fourth annual Congress held at Rochester in May last, has been received. The Union systematises scientific work among the different societies composing it, and in various ways promotes the interests of science. Next year's Congress will be held at Brighton early in June.

FROM Messrs. Williams and Norgate's very useful "Book Circular" (Scientific Series, No. 72), containing descriptive notes on the contents of recent foreign publications, we obtain the following announcements as to forthcoming scientific works:—"Die Elemente der Entwicklungslehre des Menschen und der Wirbeltiere" is the title of a work by Prof. O. Hertwig, of Berlin, which will shortly be published.—M. Le Dantec, lecturer on embryology at the University of Paris, has written a work entitled "Lamarckiens et Darwiniens," which will be issued very shortly.—"Ueber Reduktionstheilung, Spindelbildung Centrosomen und Cilienbildung im Pflanzenreiche" will be the subject of the sixth part of Prof. E. Strasburger's "Histologische Untersuchungen."—The first part of "Nouveaux éléments de botanique," by Prof. Louis Crié, of Rennes, will soon appear, and the second part will be published in the course of next year.—The fourth edition of Prof. Lapparent's "Traité de Géologie" will be issued in three parts. Of these, the first two will appear almost immediately, and the third will appear in January.

THE difficulty of preparing metallic cæsium is well known. The metal has hitherto been obtained chiefly by the electrolysis of the cyanide mixed with barium cyanide, but the unsatisfactory character of this process is sufficiently shown by the price of the product, which is about twenty-eight shillings a gramme. It has been shown quite recently by Herren Graeffe and Eckhardt that cæsium can be prepared easily and with an almost theoretical yield by the reduction of cæsium carbonate by means of magnesium powder. The mixture is heated in an iron tube through which a slow current of hydrogen passes. The metal distils over, and is collected under melted paraffin. It has a silvery lustre with a slight yellow tint, and remains bright under paraffin. On exposure to air it oxidises rapidly, melts, and finally inflames. In its action on water it resembles potassium. A previous attempt by Winkler to prepare cæsium by reducing the carbonate with magnesium failed, and led that chemist to doubt the statement of Beketoff that the reducibility of the alkaline carbonates increased with increasing atomic weight of the metal. Herren Graeffe and Eckhardt, however, confirm Beketoff's conclusion, and show that cæsium is more easily reducible than rubidium, and rubidium than potassium.

THE additions to the Zoological Society's Gardens during the past week include a Sykes's Monkey (*Cercopithecus albigularis*) from East Africa, presented by Lord Alexander Thynne; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. W. J. Beard; a Vervet Monkey (*Cercopithecus lalandii*) from South Africa, a Viverrine Phalanger (*Pseudochirus cooki*) from Tasmania, an Agile Wallaby (*Macropus agilis*) from Australia, a Brown Capuchin (*Cebus fatuellus*) from Guiana, a Rufous-necked Wallaby (*Macropus ruficollis*) from New South Wales, three Cardinal Eclectus (*Eclectus cardinalis*) from Amboyna, four Serrated Terrapins (*Chrysemys scripta*), three Prickly Trionyx (*Trionyx spinifer*), four Menobranchs (*Necturus maculatus*), an Amphiuma (*Amphiuma means*) from North America, three Mute Swans (*Cygnus olor*), European, deposited; a Black-backed Jackal (*Canis mesomelas*) from South Africa, two Brazilian Caracaras (*Polyborus brasiliensis*), an Anaconda (*Eunectes murinus*) from South America, purchased; a Spring-Bok (*Gazella euchore*) from South Africa, received in exchange; a Hog Deer (*Cervus porcinus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE ANDROMEDES.—In respect to the reported observation of Biela's comet, no confirmation of which, however, is yet to hand, it will be well to keep careful watch on the character of the second November display. The maximum is timed to occur from the 23rd to the 27th, the approximate coordinates of the radiant being

R.A. = 1h. 40m.
Decl. = +44°;

that is, a little north-west of γ Andromedæ. The usua characteristic of these meteors is their slow flight, in contrast tc the swift Leonids, and this should facilitate photographic impressions of them being obtained.

HOLMES' COMET (1899 *d*).

Ephemeris for 12h. Greenwich Mean Time.

1899.	R.A.	Decl.
	h. m. s.	° ′ ″
Nov. 16 ...	2 20 25·87 ...	+48 25 43·7
17 ...	19 24·98 ...	19 55·4
18 ...	18 25·68 ...	13 51·5
19 ...	17 28·03 ...	7 32·5
20 ...	16 32·09 ...	48 0 59·3
21 ...	15 37·93 ...	47 54 12·3
22 ...	14 45·60 ...	47 12·4
23 ...	2 13 55·17 ...	+47 40 0·2

OCCULTATION OF NEPTUNE.—On Sunday evening next, November 19, there will be an occultation of Neptune, visible throughout the whole of northern Europe, for the observation of which the following particulars will be useful :—

	Sidereal time.	Mean time.	Angle from North point.	Angle from Vertex.
	h. m.	h m.	°	°
Disappearance...	22 4 ...	6 10 ...	95 ...	129
Reappearance ...	22 56 ...	7 1 ...	261 ...	299

The angles given will facilitate the adjustment of the moon's image so as to bring the points of "immersion" and "emersion" into the positions of best definition. The "angle from the north point" is the angle subtended at the centre of the moon's disc by the arc extending from the star when in contact to the point of intersection of the moon's limb by a great circle passing through the North Pole; the "angle from the vertex" is the angle subtended by the arc extending from the star to the point of intersection of the limb by a vertical great circle passing through the zenith.

For the convenience of observers south of London it may be mentioned that the limits of latitude for this occultation are 90° N. to 25° N.

"THE HEAVENS AT A GLANCE" (1900).—Mr. Arthur Mee, of Cardiff, has published his annual astronomical calendar, upon which is given a concise tabulation of the more important astronomical constants and events for the coming year. One half of the card constitutes a celestial diary, indicating the favourable dispositions of the various constellations for each month, the sun's declination, phases of the moon, and configuration of the planets, with detailed enumeration of occultations and variable star phenomena. Following this, descriptive notes are given of the prominent features visible on the moon at various stages throughout the lunation; times of elongation, opposition, &c., of the planets throughout the year; a list of the more prominent meteor showers, the eclipses of the year, and several facts concerning variable stars. The whole is printed on a single card, facilitating its being kept within reach for instant reference by the observer's side, and thus specially recommends itself to the amateur who may be unable to spare the time necessary for obtaining the information from the more complete reference works of the observatory. Astronomical time is used throughout, and all the data are for Greenwich, but are applicable with slight corrections to the whole of the British Isles. Not the least important feature is the clear style of arrangement and printing, which will render its use more pleasant under actual working conditions.

THE CONFERENCE OF GERMAN MEN OF SCIENCE AT MUNICH.

THE seventy-first meeting of the Society of German Naturalists and Physicians opened at Munich on September 17, and continued until the 23rd.

A great disaster had just visited the city; the floods which had wrought such havoc throughout the Salzkammergut and South Bavaria culminated their work of destruction in Munich, where the Isar, rising many metres in a few hours, destroyed two of the finest bridges in the capital, inundated the low-lying parts of the town, and threw out of gear the Electric Works and many factories along the banks; many lives were lost.

The Prince Regent bridge, which was entirely destroyed, was the gift of the ruler whose name it bears; the original cost was 1,500,000 marks, and the munificent Prince has undertaken to bear the cost of rebuilding the same.

In spite of the dislocation of all routes of communications, the congress was attended by about 3500 members. The proceedings opened with a gala meeting in the Royal Theatre on Monday, September 18, when the congress was inaugurated by Councillor von Winckel, and the members were welcomed, on behalf of the Prince Regent, by Prince Ludwig Ferdinand, who evinced his interest by attending all subsequent general meetings.

After several other speeches had been delivered, Dr. Fridtjof Nansen ascended the tribune and summarised the scientific results of his Polar Expedition.

Parenthetically, it is interesting to note that three of the most remarkable addresses were delivered by foreigners—Nansen, van t' Hoff and Ramsay—in fluent German.

Nansen showed the typical glacial appearance of the Siberian coast, then described Franz Josef's Land, which is far less extensive than appears on the maps; the land is almost entirely covered with ice, relieved here and there with masses of black basalt rocks, which rest on a seam of clay some 500 feet in thickness.

The Arctic Ocean may be considered as a kind of lagoon separated from the Atlantic by a submarine range of mountains, stretching from Spitsbergen to Greenland; this range is responsible for a curious condition of things. The Arctic Ocean is covered with a layer of brackish water containing a low percentage of salt, and collected from the Siberian rivers and the Bering Strait; below this is Gulf Stream water, containing a normal quantity of salt.

If these two layers of water were mixed, the average temperature would fall, but this average would not be so cold as that of the surface layer of Arctic water; this condition accounts for the enormous formation of ice in the polar region.

The points were all illustrated by photographs, tables and diagrams, and drawings of the diatoms found in the fresh-water lakes, formed by the sun melting the surface of the ice, were shown.

The lecturer was followed by Prof. von Bergmann, who demonstrated the value of radiography in the diagnosis of surgical diseases; and by Prof. Förster, who described the alteration in the face of the heavens from the remotest periods down to the present time.

After these addresses many members adjourned to the Technical College, the whole of which magnificent building had been placed at the disposal of the congress, and where reading and writing rooms, reception and inquiry offices, a restaurant, &c., were to be found.

Here the daily programme was to be obtained, and each member of the congress was presented by the city with an admirable album of views and a "Festschrift."

The Festschrift was a magnificent quarto volume describing the development of Munich under the influence of the natural sciences during the last decades. The first part of the work was devoted to vital statistics and general municipal organisation. A few facts are, however, of general interest and formed the subject of addresses during the congress.

The Electrical Works on the Isar are a most remarkable example of a municipal undertaking; besides the current used for the electric cars, lighting, telegraph and telephone purposes, they supply current to work 172 motors (1329 H.P.), 13,500 incandescent and 329 arc-lights in 91 factories. Besides the Corporation works, there are 317 private installations, of which 69 use gas, 39 water, and 179 steam to supply the motive power.

The population of Munich is 450,000. The cost of lighting the streets (incandescent gas and arc-lights) represented last year, per head of the population, a yearly cost of 1·925 marks; in 1881 the cost was less than half this sum, 0·81 mark per head.

Of the two most prominent industries in Munich, the second, the industrial production of cold, originated in the demands and necessities of the first, the brewing industry.

In 1898 there were 24 breweries, producing 1,540,000 hectolitres of beer. Munich has always been celebrated for its beer, and in the year 1500 possessed 38, in 1618 no less than 69 breweries.